BACHELOR OF SCIENCE - COMPUTER SCIENCE (B.Sc)

CATEGORY	COURSE CODE	TITLE	C	P	CREDIT
CORE: I	17CSU01	COMPUTING FUNDAMENTALS AND C PROGRAMMING	48	-	4

Preamble

To learn about the Computer fundamentals and the C programming language concepts.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Obtain basic fundamentals of computers	K1,K2
CO2	Learn basics of C language	K1,K2
CO3	Understand the control structure	K2,K5
CO4	Familiarize in functions and structure and unions	K3,K4
CO5	Analyze pointers and file	K4,K5

CATEGORY	COURSE CODE	TITLE	C	P	CREDIT
CORE: II	17CSU02	DIGITAL FUNDAMENTALS AND COMPUTER ARCHITECTURE	48	-	4

Preamble

To learn about Computer Fundamentals and its Architecture.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	To provide a insight of how basic computer components are specified	K1,K2
CO2	Ability to understand the digital logic circuits and their design	K2,K3,K5
CO3	Acquire knowledge of Input-Output interfaces	K3
CO4	Ability to handle interrupts	K4,K5
CO5	Ability to work with memory organization	K4

CATEGORY	COURSE CODE	TITLE	C	P	CREDIT
CORE :III	17CSU03	PROGRAMMING IN C -PRACTICAL	-	36	4

Subject Description: This course provides hands on experience on C Programming
Goal: To enable the students to develop software in C language
Objectives: On successful completion of the course the students will
        understand the concepts of C language and expertise in using C

CATEGORY	COURSE CODE	TITLE	C	P	CREDIT
FOUNDATION COURSE :I	17FCU01	ENVIRONMENTAL STUDIES	24	-	2

Preamble

To bring about an awareness of a variety of environmental concerns and to create a pro-environmental attitude and a behavioral pattern in society that is based on creating sustainable lifestyle.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	To give information about the environment and the resources to act at our own level to protect them.	K1
CO2	To analyze the roles of organisms as part of interconnected food webs, populations, communities, and ecosystems	K4
CO3	Understand the scale dependence of biodiversity and its measurement	K2
CO4	To learn how to assess pollution sources, study exposure pathways and fate, and evaluate consequences of human exposure to pollution and its impacts to environmental quality.	K1,K3
CO5	To balance our economic, environmental and social needs, allowing prosperity for now and future generations	K5

CATEGORY	COURSE CODE	TITLE	C	P	CREDIT
CORE :IV	17CSU05	PROGRAMMING IN C++	60	-	4

Preamble

To learn about Object Oriented Concepts through C++.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Learn basics of OOPS	K1,K2
CO2	Understand functions in C++	K2
CO3	Learn the inheritance concepts	K3,K4
CO4	Ability to learn pointers	K3,K5
CO5	Know about error handling	K4,K5

CATEGORY	COURSE CODE	TITLE	C	P	CREDIT
CORE:V	17CSU06	PROGRAMMING IN C++ - PRACTICAL	-	48	4

Subject Description: This course provides rich experience on C++ Programming
Goal: To enable the students to develop software in C++ language
Objectives: On successful completion of the course the students will
understand the concepts of C++ language and expertise in using C++

CATEGORY	COURSE CODE	TITLE	C	P	CREDIT
CORE : VI	17CSU07	PROGRAMMING IN HTML-PRACTICAL	-	24	2

Subject description: This course provide complete knowledge in HTML
Goal: To enable the students to develop HTML web page
Objectives: On successful completion of the course the students will
understand the applications of HTML and create web page

CATEGORY	COURSE CODE	TITLE	C	P	CREDIT
FOUNDATION COURSE: II	17FCU02	YOGA & VALUE EDUCATION	24	-	2

Preamble

To enable the learners to acquire the knowledge on basic yogasanas and values and practice them in real life.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Acquire the basic knowledge on yoga and value education.	K1
CO2	Understand the importance of yoga, mental exercises, principles of life and components of values	K2
CO3	Enhance their physical and mental health by practicing the different types of asanas, kriyas, mental exercises and values.	K3
C04	Lead a meaningful life for the fulfillment of the needs of family, workplace, society and country.	K4

CATEGORY	COURSE CODE	TITLE	C	P	CREDIT
CORE:VII	17CSU09	DATA STRUCTURES	60	-	4

Preamble

To learn about the various data structures and algorithms and their applications.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Obtain basics of computer algorithm	K1,K2
CO2	Understand the tree and table structures	K2,K5
CO3	Familiarize in sorting algorithms	K3,K4
CO4	Analyze file organizations and indexing	K4,K5

CATEGORY	COURSE CODE	TITLE	C	P	CREDIT
CORE:VIII	17CAU10	JAVA PROGRAMMING	60	-	4

Preamble

To inculcate knowledge on Java Programming concepts.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Learn basic concepts Java Programming Language	K1,K2
CO2	Acquire knowledge of control structures	K1,K2
CO3	Familiarize in Java Programming	K2,K5
CO4	Create wide range of Applications and Applets using Java	K3,K4
CO5	Ability to work with I/O Streams	K4,K5

CATEGORY	COURSE CODE	TITLE	C	P	CREDIT
CORE:IX	17CSU11	PROGRAMMING IN JAVA - PRACTICAL	-	60	4

Subject Description: This course provides hands on experience on Java Programming.

Goal: Enable to create wide range of Applications and Applets using Java.

Objective: On successful completion of the course the students will understand the concepts of Java Programming language and expertise in using Java.

CATEGORY	COURSE CODE	TITLE	C	P	CREDIT
CORE:X	17CSU12	DATA COMMUNICATION & NETWORKS	48	-	3

Preamble

To introduces the details about basic concepts of data communication and networking.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Ability to understand basics of Data Communication	K1,K2
CO2	Understand basic concepts Transmission Media, Switching and Routing Techniques	K1,K2
CO3	Acquire knowledge of Network types	K2,K5
CO4	Familiarize in internetworking	K3,K4
CO5	Analyze Communication protocols	K4,K5

CATEGORY	COURSE CODE	TITLE	C	P	CREDIT
SKILL ENHANCEMENT COURSE:I	17SEU01	INFORMATION SECURITY	24	-	2

Preamble

To learn about the basics of Information Security.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Obtain fundamental knowledge of Information Security	K1,K2
CO2	Learn basic concepts of Risks in Information Security	K1,K2
CO3	Familiarize the ideas of security planning and policies	K2,K3
CO4	Understand with Privacy and Ethical Issues in Information Security	K3,K4
CO5	Learn about Cryptography	K4, K5

CATEGORY	COURSE CODE	TITLE	C	P	CREDIT
NON-MAJOR ELECTIVE:I	17NMU01A	INDIAN WOMEN AND SOCIETY	24	-	2

Preamble

To familiarize students with the specific cultural contexts of women in India

Course Outcomes

On the successful completion of the course, students will be able to:

CO Number	CO Statement	Knowledge Level
CO1	Demonstrate knowledge of the history of women's studies as an academic discipline	K1,K2
CO2	Analyze the various roles of women and the challenges faced by them in the society	K3
CO3	Assimilate and evaluate the importance of women health	K3,K5
CO4	Identify the different issues related to women in general	K4
CO5	Assessing the Women Empowerment and the role of Central & State Government in developing Women	K5

CATEGORY	COURSE CODE	TITLE	C	P	CREDIT
CORE:XII	17CSU15	OPERATING SYSTEM	72	-	5

Preamble

 To learn about basic operating system abstractions, mechanisms and their implementations.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Understand Operating System	K1,K2,K4
CO2	Learn process handling	K2,K3,K4
CO3	Analyze how multi program is handled	K2,K3,K4
CO4	Obtain knowledge in storage	K2,K3
CO5	Learn scheduling algorithms	K2,K3,K4.K5

CATEGORY	COURSE CODE	TITLE	C	P	CREDIT
CORE:XIII	17CAU16	LINUX PROGRAMMING	72	-	5

Preamble

To learn about Linux programming languages, tools and concepts.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Learn fundamentals of Linux	K1,K2
CO2	Obtain knowledge in files	K2,K3
CO3	Gain information about how Linux environment works	K2,K3,K4
CO4	Learn basics of terminal communication	K1,K2
CO5	Learn about curses	K2,K3,K4

CATEGORY	COURSE CODE	TITLE	C	P	CREDIT
CORE:XIV	17CAU17	PROGRAMMING IN LINUX - PRACTICAL	-	72	4

Subject Description: This course provides programming knowledge in Linux
Goal: To enable the students to gain skills in shell programming
Objectives: On successful completion of the course the students will understand the concepts of Operating System through Linux

CATERGORY	COURSE CODE	TITLE	C	P	CREDIT
ALLIED:IV	17CSU18	BUSINESS ACCOUNTING	60	-	3

Preamble

To impart basic accounting knowledge

Course Outcomes

On successful completion of the course the students should have:

CO Number	CO Statement	Knowledge Level
CO1	Understood financial accounting	K1,K2,K4
CO2	Learn accounting concepts	K2,K3,K4
CO3	Learnt transactions	K2,K3,K4
CO4	Acquire knowledge of cost accounts	K3
CO5	Learnt management accounting	K2,K3,K4.K5

CATERGORY	COURSE CODE	TITLE	C	P	CREDIT
SKILL ENHANCEMENT COURSE: II	17SSU02	TALLY- PRACTICAL	-	48	2

Subject Description: To include the different accounting applications using Tally.
Goals: To impart knowledge on the different accounting applications using Tally
Objectives: On successful completion of the course the students will understand the accounting applications using Tally

CATERGORY	COURSE CODE	TITLE	C	P	CREDIT
CORE : XVI	17CSU20	RELATIONAL DATABASE MANAGEMENT SYSTEM	72	-	4

Preamble

To enable the students to learn about the concepts of database system and manipulation of data.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Understand the basic concepts of database system	K1,K2
CO2	Ability to implement the relational database concepts	K3,K5
CO3	Acquire the deep knowledge on normalization techniques	K2,K3,K4
CO4	Understand the detailed knowledge on PL/SQL	K3,K4,K5
CO5	Ability to work with PL/SQL statements	K5

CATERGORY	COURSE CODE	TITLE	C	P	CREDIT
CORE : XVII	17CSU21	VB.NET PROGRAMMING	72	-	4

Preamble

To enable the students to learn about the .NET Framework and VB.NET programming.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Understand the .NET framework programming	K1,K2
CO2	Acquire the deep knowledge on data types, operators and control statements in VB.NET	K2,K3,K4
CO3	Implement the concept of arrays, procedures and structures using various VB.NET controls	K3,K5
CO4	Ability to work with menus and dialog boxes in VB.NET	K4,K5
CO5	Ability to handle exceptions and effectively work with database connectivity using ADO.NET	K3,K5

CATERGORY	COURSE CODE	TITLE	C	P	CREDIT
CORE : XVIII	17CSU22	PROGRAMMING IN VB.NET AND ORACLE - PRACTICAL	-	72	4

Subject Description: This course provides hands on experience on VB.NET Programming and Oracle

Goal: To enable the students to work effectively with VB.NET and Oracle

Objectives: On successful completion of the course the students will be able to build real world applications using VB.NET and Oracle

Core Optional

A student shall take up one **CORE OPTIONAL** course offered by other departments under Part: III to complete the programme. The score obtained in this course will be accounted for CGPA calculation. The enrollment is based on first come first served basis depending upon the available strength. The following is the list of optional papers offered by each department.

CATERGORY	COURSE CODE	TITLE	C	P	CREDIT
CORE :XIX	**	**CORE OPTIONAL**	36	-	3

Subject description: This course provide complete knowledge in Adobe Pagemaker and Coreldraw

Goal: To enable the students to develop and design with creativity

Objectives: To learn how to create and design real-time applications

CATEGORY	COURSE CODE	TITLE	C	P	CREDIT
ELECTIVE:I	17CSU25A	E-LEARNING	72	-	4

Preamble

To understand the basic concepts of E-Learning and its tools.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Understand the evolution of E-Learning and its tools	K1,K2
CO2	Obtain the knowledge about Flash and its tools	K3,K4
CO3	Gain the deep knowledge on animation and its effects	K3,K4
CO4	Acquire the knowledge on sound and video effects in flash	K3,K4,K5
CO5	Ability to develop a video using adobe premiere	K5,K6

CATEGORY	COURSE CODE	TITLE	C	P	CREDIT
ELECTIVE:I	17CSU25B	CLIENT SERVER COMPUTING	72	-	4

Preamble

To understand the basic concepts of Client/Server computing and explore the components of Client/Server communications.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Understand the Client/Server technology and its advantages	K1,K2
CO2	Understand the role of Client and Server	K2
CO3	Gain the deep knowledge on Client/Server communications	K2,K3
CO4	Acquire the knowledge on hardware and software for Client/Server technology	K3,K4
CO5	Obtaining the deep knowledge on Future of Client/Server computing	K4,K5

CATEGORY	COURSE CODE	TITLE	C	P	CREDIT
ELECTIVE:I	17CSU25C	MOBILE COMPUTING TECHNIQUES	72	-	4

Preamble

To learn about the mobile computing basics and advanced techniques.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Understand the emergence of Mobile technology and its architecture	K1,K2
CO2	Acquire the knowledge on mobile computing through telephony	K2,K3
CO3	Learn about emerging technologies	K2,K3
CO4	Provide the insight on GPRS	K3,K4
CO5	Acquire the knowledge on CDMA and 3G	K4,K5

CATEGORY	COURSE CODE	TITLE	C	P	CREDIT
SKILL ENHANCEMENT COURSE: III	17SSU03	PHOTOSHOP-PRACTICAL	-	36	2

Subject Description: This course provides hands on experience on designing in Photoshop
Goal: To enable the students to develop designing skills in Photoshop
Objectives: On successful completion of the course the students will understand the concepts of Photoshop

CATERGORY	COURSE CODE	TITLE	C	P	CREDIT
PROFICIENCY ENHANCEMENT	17PEU01	SOFTWARE PROJECT MANAGEMENT	-	-	2

Preamble

To inculcate the knowledge on how to manage a Software Project.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Understand the importance of software product life cycle	K1,K2
CO2	Obtaining the knowledge thoroughly on software requirements gathering	K2, K3,K4
CO3	Gain detailed understanding on estimation concepts	K3,K5
CO4	Acquire familiarity on design and development phases	K4,K5
CO5	Accumulate and apply the knowledge on project testing phase	K4,K5

CATEGORY	COURSE CODE	TITLE	C	P	CREDIT
CORE:XXII	17CSU27	RESEARCH METHODOLOGY	72	-	5

Preamble

To enhance the ethical conduct of research and to learn about its techniques

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Understand the basic concepts of Research	K1,K2
CO2	Acquire the deep knowledge on Research problem and its design	K1,K2
CO3	Familiarize on sampling design	K2,K3
CO4	Give detailed understanding about data collection	K3,K4,K5
CO5	Ability to work with interpretation and writing reports	K5

CATEGORY	COURSE CODE	TITLE	C	P	CREDIT
CORE:XXIII	17CSU28	COMPUTER GRAPHICS AND MULTIMEDIA	72	-	5

Preamble

To learn about reconstruction and visualization framework and to give introduction on basic algorithms and its techniques.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Provide a insight of computer graphics and algorithms	K1,K2
CO2	Ability to understand the Transformations and its types	K2,K3,K4
CO3	Acquire knowledge on window transformations	K3,K4
CO4	Learn about Multimedia basics	K1,K2
CO5	Obtain basic fundamentals of image, audio and video	K5

CATEGORY	COURSE CODE	TITLE	C	P	CREDIT
CORE:XXIV	17CSU29	PROGRAMMING IN 3D MAX-PRACTICAL	-	72	4

Subject Description: This course provides hands on experience on 3D Max Programming
Goal: To enable the students to equip them with graphics and multimedia skills
Objectives: On successful completion of the course the students will understand the concept of 3D Max and expertise in using graphics and multimedia

CATEGORY	COURSE CODE	TITLE	C	P	CREDIT
ELECTIVE:II	17CSU30A	WEB TECHNOLOGY	60	-	4

Preamble

To learn about Web technologies and its functionalities

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Provide a insight on the basics of Internet	K1,K2
CO2	Ability to understand the basics of web page creation	K1,K2
CO3	Acquire knowledge on creating cascading style sheets	K2,K3
CO4	Provide the insight on the introduction to servlets	K2,K3,K4
CO5	Ability to work with JSP sessions	K3,K4

CATEGORY	COURSE CODE	TITLE	C	P	CREDIT
ELECTIVE:II	17CSU30B	CLOUD COMPUTING TECHNIQUES	60	-	4

Preamble

To learn about cloud computing technologies, functions and its uses

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Provide an insight on the basics of cloud computing technology	K1,K2
CO2	Ability to understand the concept of virtualization	K2,K3
CO3	Acquire knowledge on the cloud infrastructure and its resources	K2,K3
CO4	Gives detailed view on securities in the cloud	K4
CO5	Explain about other technologies outside the cloud	K4,K5

CATEGORY	COURSE CODE	TITLE	C	P	CREDIT
ELECTIVE:II	17CSU30C	INTRODUCTION TO COMPILER DESIGN	60	-	4

Preamble

To understand the principles of Compiler design

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Ability to understand the basics of compilers and lexical analysis	K1,K2
CO2	Understand the concept of syntactic specification of programming languages and parsing techniques	K2,K3
CO3	Acquire knowledge on the syntax and symbol tables	K2,K3
CO4	Provide a insight on runtime storage and error recovery	K4,K5
CO5	General introduction on code optimization and generation	K2,K3,K4

CATERGORY	COURSE CODE	TITLE	C	P	CREDIT
ELECTIVE : III	17CSU31A	BIG DATA ANALYTICS	60	-	4

Preamble

To provide grounding in basic and advanced methods to big data technology and tools, including MapReduce and Hadoop and its ecosystem

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Obtain the basics of big data analytics	K1,K2
CO2	Acquire the knowledge on Hadoop	K1,K2
CO3	Learn to build and maintain reliable, scalable, distributed systems with Hadoop	K2,K3
CO4	Able to apply Hadoop ecosystem components	K3,K4
CO5	Understand the basics of HIVE and its usage	K2,K3,K4

CATEGORY	COURSE CODE	TITLE	C	P	CREDIT
ELECTIVE:III	17CSU31B	GREEN COMPUTING	60	-	4

Preamble

To acquire knowledge to adopt green computing practices to minimize negative impacts on the environment, skill in energy saving practices in their use of hardware, examine technology tools that can reduce paper waste and carbon footprint by user, and to understand how to minimize equipment disposal requirements.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Obtain the fundamentals of green computing and its IT strategies	K1,K2
CO2	Learn about green assets, modeling and information systems	K2,K3
CO3	Acquire knowledge on grid framework	K2,K3
CO4	Understand the concept of green compliance	K2,K3
CO5	Work with case studies	K5,K6

CATEGORY	COURSE CODE	TITLE	C	P	CREDIT
ELECTIVE:III	17CSU31C	GRID COMPUTING	60	-	4

Preamble

To learn about the Grid environment, building software systems and components that scale to millions of users in modern internet, Grid concepts capabilities across the various Grid services.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Obtain the basics of grid computing	K1,K2
CO2	Classify the various grid computing technologies	K2,K3
CO3	Learn to build an architecture of Grid computing	K2,K3
CO4	Understand Grid computing standards	K2,K3,K4
CO5	Provide an insight about functionality requirements and services	K3,K4

CATEGORY	COURSE CODE	TITLE	C	P	CREDIT
SKILL ENHANCEMENT COURSE:IV	17SSU04	SOFTWARE TESTING - PRACTICAL	-	24	2

Subject Description: This course provides an opportunity to develop testing skills and to learn different kinds of testing.

Goal: To enable the students to equip them with testing the software after development phase.

Objectives: On successful completion of the course the students will understand the concept of software testing and expertise in using testing in software.

COURSE OUTCOME(CO)
BACHELOR COMPUTER APPLICATIONS (BCA)

CATERGORY	COURSE CODE	TITLE	C	P	CREDIT
CORE:I	17CAU01	**COMPUTING FUNDAMENTALS AND C PROGRAMMING**	48	-	4

Preamble

To learn about the Computer fundamentals and the C programming language concepts

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Obtain basic fundamentals of computers	K1,K2
CO2	Learn basics of C language	K1,K2
CO3	Understand the control structure	K2,K5
CO4	Familiarize in functions and structure and unions	K3,K4
CO5	Analyze pointers and file	K4,K5

CATERGORY	COURSE CODE	TITLE	C	P	CREDIT
CORE:II	17CAU02	DIGITAL FUNDAMENTALS AND COMPUTER ARCHITECTURE	48	-	4

Preamble

To learn about Computer Fundamentals and its Architecture.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	To provide a insight of how basic computer components are specified	K1,K2
CO2	Ability to understand the digital logic circuits and their design	K2,K3,K5
CO3	Acquire knowledge of Input-Output interfaces	K3
CO4	Ability to handle interrupts	K4,K5
CO5	Ability to work with memory organization	K4

CATERGORY	COURSE CODE	TITLE	C	P	CREDIT
CORE:III	17CAU03	PROGRAMMING IN C –PRACTICAL	-	36	4

Subject Description: This course provides hands on experience on C Programming

Goal: To enable the students to develop software in C language

Objectives: On successful completion of the course the students will

        understand the concepts of C language and expertise in using C

CATERGORY	COURSE CODE	TITLE	C	P	CREDIT
FOUNDATION COURSE: I	17FCU01	ENVIRONMENTAL STUDIES	24	-	2

Preamble

To bring about an awareness of a variety of environmental concerns and to create a pro-environmental attitude and a behavioral pattern in society that is based on creating sustainable lifestyle.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	To give information about the environment and the resources to act at our own level to protect them.	K1
CO2	To analyse the roles of organisms as part of interconnected food webs, populations, communities, and ecosystems	K4
CO3	Understand the scale dependence of biodiversity and its measurement	K2
CO4	To learn how to assess pollution sources, study exposure pathways and fate, and evaluate consequences of human exposure to pollution and its impacts to environmental quality.	K1,K3
CO5	To balance our economic, environmental and social needs, allowing prosperity for now and future generations	K5

CATERGORY	COURSE CODE	TITLE	C	P	CREDIT
CORE:IV	**17CAU05**	**PROGRAMMING IN C++**	60	-	4

Preamble

To learn about Object Oriented Concepts through C++.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Learn basics of OOPS	K1,K2
CO2	Understand functions in C++	K2
CO3	Learn the inheritance concepts	K3,K4
CO4	Ability to learn pointers	K3,K5
CO5	Know about error handling	K4,K5

CATERGORY	COURSE CODE	TITLE	C	P	CREDIT
CORE:V	17CAU06	PROGRAMMING IN C++ -PRACTICAL	-	48	4

Subject Description: This course provides rich experience on C++ Programming
Goal: To enable the students to develop software in C++ language
Objectives: On successful completion of the course the students will
       understand the concepts of C++ language and expertise in using C++

CATERGORY	COURSE CODE	TITLE	C	P	CREDIT
CORE:VI	17CAU07	PROGRAMMING IN HTML-PRACTICAL	-	24	2

Subject Description: This course provide complete knowledge in HTML
Goal: To enable the students to develop HTML web page
Objectives: On successful completion of the course the students will
       understand the applications of HTML and create web page

CATERGORY	COURSE CODE	TITLE	C	P	CREDIT
FOUNDATION COURSE : II	17FCU02	YOGA & VALUE EDUCATION	24	-	2

Preamble

To enable the learners to acquire the knowledge on basic yogasanas and values and practice them in real life.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Acquire the basic knowledge on yoga and value education.	K1
CO2	Understand the importance of yoga, mental exercises, principles of life and components of values	K2
CO3	Enhance their physical and mental health by practicing the different types of asanas, kriyas, mental exercises and values.	K3
C04	Lead a meaningful life for the fulfillment of the needs of family, workplace, society and country.	K4

CATERGORY	COURSE CODE	TITLE	C	P	CREDIT
CORE:VII	17CAU09	DATA STRUCTURES	60	-	4

Preamble

To learn about the various data structures and algorithms and their applications.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Obtain basics of computer algorithm	K1,K2
CO2	Understand the tree and table structures	K2,K5
CO3	Familiarize in sorting algorithms	K3,K4
CO4	Analyze file organizations and indexing	K4,K5

CATERGORY	COURSE CODE	TITLE	C	P	CREDIT
CORE:VIII	17CAU10	JAVA PROGRAMMING	60	-	4

Preamble

To inculcate knowledge on Java Programming concepts.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Learn basic concepts Java Programming Language	K1,K2
CO2	Acquire knowledge of control structures	K1,K2
CO3	Familiarize in Java Programming	K2,K5
CO4	Create wide range of Applications and Applets using Java	K3,K4
CO5	Ability to work with I/O Streams	K4,K5

CATERGORY	COURSE CODE	TITLE	C	P	CREDIT
CORE:IX	17CAU11	PROGRAMMING IN JAVA - PRACTICAL	-	60	4

Subject Description: This course provides hands on experience on Java Programming.

Goal: Enable to create wide range of Applications and Applets using Java.

Objective: On successful completion of the course the students will understand the concepts of Java Programming language and expertise in using Java.

CATERGORY	COURSE CODE	TITLE	C	P	CREDIT
CORE:X	17CAU12	PROGRAMMING IN PHP WITH SYMFONY	48	-	4

Preamble

To introduce the details about basic concepts of programming in PHP.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Ability to understand basics of PHP	K1,K2
CO2	Understand basic concepts File system and Website	K1,K2
CO3	Acquire knowledge of Handling of Database and Table	K2,K5
CO4	Familiarize in Mailing Concepts	K3,K4
CO5	Creating applications using Symfony	K4,K5

CATERGORY	COURSE CODE	TITLE	C	P	CREDIT
SKILL ENHANCEMENT COURSE : I	17SEU01	INFORMATION SECURITY	24	-	2

Preamble

To learn about the basics of Information Security.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Obtain fundamental knowledge of Information Security	K1,K2
CO2	Learn basic concepts of Risks in Information Security	K1,K2
CO3	Familiarize the ideas of security planning and policies	K2,K3
CO4	Understand with Privacy and Ethical Issues in Information Security	K3,K4
CO5	Learn about Cryptography	K4, K5

CATEGORY	COURSE CODE	TITLE	C	P	CREDIT
NON-MAJOR ELECTIVE:I	17NMU01A	INDIAN WOMEN AND SOCIETY	24	-	2

Preamble

To familiarize students with the specific cultural contexts of women in India

Course Outcomes

On the successful completion of the course, students will be able to:

CO Number	CO Statement	Knowledge Level
CO1	Demonstrate knowledge of the history of women's studies as an academic discipline	K1,K2
CO2	Analyze the various roles of women and the challenges faced by them in the society	K3
CO3	Assimilate and evaluate the importance of women health	K3,K5
CO4	Identify the different issues related to women in general	K4
CO5	Assessing the Women Empowerment and the role of Central & State Government in developing Women	K5

CATERGORY	COURSE CODE	TITLE	C	P	CREDIT
CORE:XII	17CAU15	OPERATING SYSTEM	72	-	5

Preamble

To learn about basic operating system abstractions, mechanisms and their implementations.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Understand Operating System	K1,K2,K4
CO2	Learn process handling	K2,K3,K4
CO3	Analyze how multi program is handled	K2,K3,K4
CO4	Obtain knowledge in storage	K2,K3
CO5	Learn scheduling algorithms	K2,K3,K4.K5

CATERGORY	COURSE CODE	TITLE	C	P	CREDIT
CORE:XIII	17CAU16	LINUX PROGRAMMING	72	-	5

Preamble

To learn about Linux programming languages, tools and concepts.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Learn fundamentals of Linux	K1,K2
CO2	Obtain knowledge in files	K2,K3
CO3	Gain information about how Linux environment works	K2,K3,K4
CO4	Learn basics of terminal communication	K1,K2
CO5	Learn about curses	K2,K3,K4

CATERGORY	COURSE CODE	TITLE	C	P	CREDIT
CORE:XIV	17CAU17	PROGRAMMING IN LINUX -PRACTICAL	-	72	4

Subject Description: This course provides programming knowledge in Linux
Goal: To enable the students to gain skills in shell programming
Objectives: On successful completion of the course the students will understand the concepts of Operating System through Linux

CATERGORY	COURSE CODE	TITLE	C	P	CREDIT
ALLIED:IV	17CAU18	BUSINESS ACCOUNTING	60	-	4

Preamble

To impart basic accounting knowledge

Course Outcomes

On successful completion of the course the students should have:

CO Number	CO Statement	Knowledge Level
CO1	Understood financial accounting	K1,K2,K4
CO2	Learn accounting concepts	K2,K3,K4
CO3	Learnt transactions	K2,K3,K4
CO4	Acquire knowledge of cost accounts	K3
CO5	Learnt management accounting	K2,K3,K4.K5

CATERGORY	COURSE CODE	TITLE	C	P	CREDIT
SKILL ENHANCEMENT COURSE : II	17SAU02	PROGRAMMING IN PHP WITH SYMFONY - PRACTICAL	-	48	2

Subject Description: This course provides programming skills in PHP
Goal: To enable the students to develop web based application
Objectives: On successful completion of the course the students will understand the concepts of PHP and connectivity with My SQL

CATERGORY	COURSE CODE	TITLE	C	P	CREDIT
CORE : XVI	17CAU20	RELATIONAL DATABASE MANAGEMENT SYSTEM	72	-	4

Preamble

To enable the students to learn about the concepts of database system and manipulation of data.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Understand the basic concepts of database system	K1,K2
CO2	Ability to implement the relational database concepts	K3,K5
CO3	Acquire the deep knowledge on normalization techniques	K2,K3,K4
CO4	Understand the detailed knowledge on PL/SQL	K3,K4,K5
CO5	Ability to work with PL/SQL statements	K5

CATERGORY	COURSE CODE	TITLE	C	P	CREDIT
CORE : XVII	17CAU21	VB.NET PROGRAMMING	72	-	4

Preamble

To enable the students to learn about the .NET Framework and VB.NET programming.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Understand the .NET framework programming	K1,K2
CO2	Acquire the deep knowledge on data types, operators and control statements in VB.NET	K2,K3,K4
CO3	Implement the concept of arrays, procedures and structures using various VB.NET controls	K3,K5
CO4	Ability to work with menus and dialog boxes in VB.NET	K4,K5
CO5	Ability to handle exceptions and effectively work with database connectivity using ADO.NET	K3,K5

CATERGORY	COURSE CODE	TITLE	C	P	CREDIT
CORE : XVIII	17CAU22	**PROGRAMMING IN VB.NET AND ORACLE - PRACTICAL**	-	72	4

Subject Description: This course provides hands on experience on VB.NET Programming and

Oracle

Goal: To enable the students to work effectively with VB.NET and Oracle

Objectives: On successful completion of the course the students will be able to build real world

applications using VB.NET and Oracle

Core Optional

A student shall take up one **CORE OPTIONAL** course offered by other departments under Part: III to complete the programme. The score obtained in this course will be accounted for CGPA calculation. The enrollment is based on first come first served basis depending upon the available strength. The following is the list of optional papers offered by each department.

CATERGORY	COURSE CODE	TITLE	C	P	CREDIT
CORE :XIX	**	**CORE OPTIONAL**	36	-	3

Subject description: This course provide complete knowledge in Adobe Pagemaker and Coreldraw

Goal: To enable the students to develop and design with creativity

Objectives: To learn how to create and design real-time applications

CATERGORY	COURSE CODE	TITLE	C	P	CREDIT
ELECTIVE : I	17CAU25A	INTRODUCTION TO COMPILER DESIGN	72	-	4

Preamble

To understand the principles of Compiler design

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Ability to understand the basics of compilers and lexical analysis	K1,K2
CO2	Understand the concept of syntactic specification of programming languages and parsing techniques	K2,K3
CO3	Acquire knowledge on the syntax and symbol tables	K2,K3
CO4	Provide a insight on runtime storage and error recovery	K4,K5
CO5	General introduction on code optimization and generation	K2,K3,K4

CATERGORY	COURSE CODE	TITLE	C	P	CREDIT
ELECTIVE : I	17CAU25B	**COMPUTER NETWORKS**	72	-	4

Preamble

To understand the concepts and design of Computer Networks

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Understand the overview of networks OSI model and Physical Layer	K1,K2
CO2	Obtain the knowledge about error deduction and correction in Data Link Layer	K2,K3
CO3	Obtain the knowledge about packet switching network and addressing in Network Layer	K2,K3
CO4	Acquire the knowledge about TCP in Transport Layer	K2,K3
CO5	Ability to understand client/Server programming, WWW and Email using Application Layer	K3,K4,K5

CATERGORY	COURSE CODE	TITLE	C	P	CREDIT
ELECTIVE : I	17CAU25C	INTRODUCTION TO IMAGE PROCESSING	72	-	4

Preamble

To understand the trends and principles of Digital Image Processing

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Ability to understand the basics of digital image fundamentals and transforms	K1,K2
CO2	Understand and apply the concept of Image enhancement and restoration	K2,K3
CO3	Acquire knowledge on image compression models	K2,K3
CO4	Implement the concepts of edge detection and image segmentation	K3,K4,K5
CO5	Familiarity with knowledge representation concepts	K3,K4

CATERGORY	COURSE CODE	TITLE	C	P	CREDIT
SKILL ENHANCEMENT COURSE: III	17SAU03	TALLY- PRACTICAL	-	36	2

Subject Description: To include the different accounting applications using Tally.

Goals: To impart knowledge on the different accounting applications using Tally

Objectives: On successful completion of the course the students will understand the accounting applications using Tally

CATERGORY	COURSE CODE	TITLE	C	P	CREDIT
PROFICIENCY ENHANCEMENT	**17PEU01**	**SOFTWARE PROJECT MANAGEMENT**	-	-	**2**

Preamble

To inculcate the knowledge on how to manage a Software Project.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Understand the importance of software product life cycle	K1,K2
CO2	Obtaining the knowledge thoroughly on software requirements gathering	K2, K3,K4
CO3	Gain detailed understanding on estimation concepts	K3,K5
CO4	Acquire familiarity on design and development phases	K4,K5
CO5	Accumulate and apply the knowledge on project testing phase	K4,K5

CATERGORY	COURSE CODE	TITLE	C	P	CREDIT
CORE : XXII	**17CAU27**	**RESEARCH METHODOLOGY**	**72**	-	**5**

Preamble

To enhance the ethical conduct of research and to learn about its techniques

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Understand the basic concepts of Research	K1,K2
CO2	Acquire the deep knowledge on Research problem and its design	K1,K2
CO3	Familiarize on sampling design	K2,K3
CO4	Give detailed understanding about data collection	K3,K4,K5
CO5	Ability to work with interpretation and writing reports	K5

CATERGORY	COURSE CODE	TITLE	C	P	CREDIT
CORE : XXIII	17CAU28	COMPUTER GRAPHICS AND MULTIMEDIA	72	-	5

Preamble

To learn about reconstruction and visualization framework and to give introduction on basic algorithms and its techniques.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Provide a insight of computer graphics and algorithms	K1,K2
CO2	Ability to understand the Transformations and its types	K2,K3,K4
CO3	Acquire knowledge on window transformations	K3,K4
CO4	Learn about Multimedia basics	K1,K2
CO5	Obtain basic fundamentals of image, audio and video	K5

CATERGORY	COURSE CODE	TITLE	C	P	CREDIT
CORE :XXIV	17CAU29	PROGRAMMING IN 3D MAX- PRACTICAL	-	72	4

Subject description: This course provides hands on experience on 3D Max Programming

Goal: To enable the students to equip them with graphics and multimedia skills

Objectives: On successful completion of the course the students will understand the concept of 3D Max and expertise in using graphics and multimedia

CATERGORY	COURSE CODE	TITLE	C	P	CREDIT
ELECTIVE : II	17CAU30A	NETWORK SECURITY	60	-	4

Preamble

To provide grounding in basic and advanced methods in network security and its effective algorithms

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Obtain the basics of network security	K1,K2
CO2	Acquire the knowledge on symmetric key algorithms	K2,K3
CO3	Learn about Asymmetric Key Algorithms and Digital Signatures	K2,K3,K4
CO4	Provide the insight on digital certificates	K2,K3
CO5	Understand about Network Security, Firewalls and Virtual Private Networks	K1,K2

CATERGORY	COURSE CODE	TITLE	C	P	CREDIT
ELECTIVE : II	17CAU30B	BIG DATA ANALYTICS	60	-	4

Preamble

To provide grounding in basic and advanced methods to big data technology and tools, including MapReduce and Hadoop and its ecosystem

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Obtain the basics of big data analytics	K1,K2
CO2	Acquire the knowledge on Hadoop	K1,K2
CO3	Learn to build and maintain reliable, scalable, distributed systems with Hadoop	K2,K3
CO4	Able to apply Hadoop ecosystem components	K3,K4
CO5	Understand the basics of HIVE and its usage	K2,K3,K4

CATERGORY	COURSE CODE	TITLE	C	P	CREDIT
ELECTIVE : II	17CAU30C	FUNDAMENTALS OF DISTRIBUTED COMPUTING	60	-	4

Preamble

To enable the students to learn the concepts of distributed computing

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Obtain the basics of distributed systems	K1,K2
CO2	Acquire the knowledge on distributed databases	K1,K2
CO3	Learn about the resource allocation and design considerations of databases	K2,K3
CO4	Provide the insight on client server network model	K2,K3,K4
CO5	Understand in detail about distributed databases	K2,K3

CATERGORY	COURSE CODE	TITLE	C	P	CREDIT
ELECTIVE : III	17CAU31A	E-COMMERCE	60	-	4

Preamble

To enable the students to learn the concepts of E-commerce and its usage

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Obtain the basics of E-commerce	K1,K2
CO2	Acquire the knowledge on the fundamentals of E-commerce	K2
CO3	Understand about Business of internet	K3,K4
CO4	Provide the insight on security on E-commerce	K3,K4,K5
CO5	Learn about the E-commerce opportunities in India	K4

CATERGORY	COURSE CODE	TITLE	C	P	CREDIT
ELECTIVE : III	17CAU31B	GREEN COMPUTING	60	-	4

Preamble

To acquire knowledge to adopt green computing practices to minimize negative impacts on the environment, skill in energy saving practices in their use of hardware, examine technology tools that can reduce paper waste and carbon footprint by user, and to understand how to minimize equipment disposal requirements.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Obtain the fundamentals of green computing and its IT strategies	K1,K2
CO2	Learn about green assets, modeling and information systems	K2,K3
CO3	Acquire knowledge on grid framework	K2,K3
CO4	Understand the concept of green compliance	K2,K3
CO5	Work with case studies	K5,K6

CATERGORY	COURSE CODE	TITLE	C	P	CREDIT
ELECTIVE : III	17CAU31C	WEB SERVICES	60	-	4

Preamble

To enable the students to learn the concepts of web services and its technologies

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Obtain the fundamentals of web services	K1,K2
CO2	Acquire the knowledge on the basic protocols	K2,K3
CO3	Understand about UDDI	K3,K4
CO4	Provide the insight on advanced web based technologies	K4
CO5	Learn about the basics of transactions	K5

CATERGORY	COURSE CODE	TITLE	C	P	CREDIT
SKILL ENHANCEMENT COURSE : IV	**17SAU04**	**CASE TOOLS-PRACTICAL**	**-**	**24**	**2**

Subject description: This course provides hands on experience on case tools techniques

Goal: To enable the students to equip them with designing UML diagram and to generate VB code

Objectives: On successful completion of the course the students will understand the concept of case tools and to generate models

CATEGORY	COURSE CODE	TITLE	C	P	CREDIT
CORE: I	17ITU01	COMPUTING FUNDAMENTALS AND C PROGRAMMING	48	-	4

Preamble

To learn about the Computer fundamentals and the C programming language concepts.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Obtain basic fundamentals of computers	K1,K2
CO2	Learn basics of C language	K1,K2
CO3	Understand the control structure	K2,K5
CO4	Familiarize in functions and structure and unions	K3,K4
CO5	Analyze pointers and file	K4,K5

CATEGORY	COURSE CODE	TITLE	C	P	CREDIT
CORE: II	17ITU02	DIGITAL FUNDAMENTALS AND COMPUTER ARCHITECTURE	48	-	4

Preamble

To learn about Computer Fundamentals and its Architecture.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	To provide a insight of how basic computer components are specified	K1,K2
CO2	Ability to understand the digital logic circuits and their design	K2,K3,K5
CO3	Acquire knowledge of Input-Output interfaces	K3
CO4	Ability to handle interrupts	K4,K5
CO5	Ability to work with memory organization	K4

CATEGORY	COURSE CODE	TITLE	C	P	CREDIT
CORE: III	17ITU03	PROGRAMMING IN C - PRACTICAL	-	36	4

Subject Description: This course provides hands on experience on C Programming

Goal: To enable the students to develop software in C language

Objectives: On successful completion of the course the students will understand the concepts of C language and expertise in using C

CATEGORY	COURSE CODE	TITLE	C	P	CREDIT
FOUNDATION COURSE: I	17FCU01	ENVIRONMENTAL STUDIES	24	-	2

Preamble

To bring about an awareness of a variety of environmental concerns and to create a pro-environmental attitude and a behavioral pattern in society that is based on creating sustainable lifestyle.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	To give information about the environment and the resources to act at our own level to protect them.	K1
CO2	To analyse the roles of organisms as part of interconnected food webs, populations, communities, and ecosystems	K4
CO3	Understand the scale dependence of biodiversity and its measurement	K2
CO4	To learn how to assess pollution sources, study exposure pathways and fate, and evaluate consequences of human exposure to pollution and its impacts to environmental quality.	K1,K3
CO5	To balance our economic, environmental and social needs, allowing prosperity for now and future generations	K5

CATEGORY	COURSE CODE	TITLE	C	P	CREDIT
CORE: IV	17ITU05	PROGRAMMING IN C++	60	-	4

Preamble

To learn about Object Oriented Concepts through C++.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Learn basics of OOPS	K1,K2
CO2	Understand functions in C++	K2
CO3	Learn the inheritance concepts	K3,K4
CO4	Ability to learn pointers	K3,K5
CO5	Know about error handling	K4,K5

CATEGORY	COURSE CODE	TITLE	C	P	CREDIT
CORE: V	17ITU06	PROGRAMMING IN C++ - PRACTICAL	-	48	4

Subject Description: This course provides rich experience on C++ Programming
Goal: To enable the students to develop software in C++ language
Objectives: On successful completion of the course the students will understand the concepts of C++ language and expertise in using C++

CATEGORY	COURSE CODE	TITLE	C	P	CREDIT
CORE: VI	17ITU07	PROGRAMMING IN HTML-PRACTICAL	-	24	2

Subject Description: This course provide complete knowledge in HTML
Goal: To enable the students to develop HTML web page
Objectives: On successful completion of the course the students will understand the applications of HTML and create web page

CATEGORY	COURSE CODE	TITLE	C	P	CREDIT
FOUNDATION COURSE: II	17FCU02	YOGA AND VALUE EDUCATION	24	-	2

Preamble

To enable the learners to acquire the knowledge on basic yogasanas and values and practice them in real life.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Acquire the basic knowledge on yoga and value education	K1
CO2	Understand the importance of yoga, mental exercises, principles of life and components of values	K2
CO3	Enhance their physical and mental health by practicing the different types of asanas, kriyas, mental exercises and values	K3
C04	Lead a meaningful life for the fulfillment of the needs of family, workplace, society and country	K4

CATEGORY	COURSE CODE	TITLE	C	P	CREDIT
CORE: VII	17ITU09	DATA STRUCTURES	60	-	4

Preamble

To learn about the various data structures and algorithms and their applications.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Obtain basics of computer algorithm	K1,K2
CO2	Understand the tree and table structures	K2,K5
CO3	Familiarize in sorting algorithms	K3,K4
CO4	Analyze file organizations and indexing	K4,K5

CATEGORY	COURSE CODE	TITLE	C	P	CREDIT
CORE: VIII	17ITU10	JAVA PROGRAMMING	60	-	4

Preamble

To inculcate knowledge on Java Programming concepts.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Learn basic concepts Java Programming Language	K1,K2
CO2	Acquire knowledge of control structures	K1,K2
CO3	Familiarize in Java Programming	K2,K5
CO4	Create wide range of Applications and Applets using Java	K3,K4
CO5	Ability to work with I/O Streams	K4,K5

CATEGORY	COURSE CODE	TITLE	C	P	CREDIT
CORE: IX	17ITU11	PROGRAMMING IN JAVA-PRACTICAL	-	60	4

Subject Description: This course provides hands on experience on Java Programming.

Goal: Enable to create wide range of Applications and Applets using Java.

Objective: On successful completion of the course the students will understand the concepts of Java Programming language and expertise in using Java.

CATEGORY	COURSE CODE	TITLE	C	P	CREDIT
CORE: X	17ITU12	DATA MINING	48	-	4

Preamble

To learn about Data Mining and its techniques.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Understand basics of Data Mining concepts	K1,K2
CO2	Know about techniques of Data Mining	K1,K2
CO3	Understand classification algorithms	K2,K5
CO4	Familiarize in clustering techniques	K3,K4
CO5	Acquire Knowledge about association rules	K4,K5

CATEGORY	COURSE CODE	TITLE	C	P	CREDIT
ALLIED:III	17ITU13	MICROPROCESSOR AND ALP	48	-	4

Preamble

To introduces the details about basic concepts of data communication and networking.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Obtain basics of the processors	K1,K2
CO2	Familiarize with assembly level language programming	K2,K3
CO3	Understand the Architecture & Memory management	K1,K4
CO4	Familiarize the external devices to the processor according to the user requirements	K3,K4
CO5	Analyze and create novel products and solutions for the real time problems Communication protocols	K4,K5

CATEGORY	COURSE CODE	TITLE	C	P	CREDIT
SKILL ENHANCEMENT COURSE:I	17SEU01	INFORMATION SECURITY	24	-	2

Preamble

To learn about the basics of Information Security.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Obtain fundamental knowledge of Information Security	K1,K2
CO2	Learn basic concepts of Risks in Information Security	K1,K2
CO3	Familiarize the ideas of security planning and policies	K2,K3
CO4	Understand with Privacy and Ethical Issues in Information Security	K3,K4
CO5	Learn about Cryptography	K4, K5

CATEGORY	COURSE CODE	TITLE	C	P	CREDIT
NON-MAJOR ELECTIVE:I	17NMU01A	INDIAN WOMEN AND SOCIETY	24	-	2

Preamble

To familiarize students with the specific cultural contexts of women in India

Course Outcomes

On the successful completion of the course, students will be able to:

CO Number	CO Statement	Knowledge Level
CO1	Demonstrate knowledge of the history of women's studies as an academic discipline	K1,K2
CO2	Analyze the various roles of women and the challenges faced by them in the society	K3
CO3	Assimilate and evaluate the importance of women health	K3,K5
CO4	Identify the different issues related to women in general	K4
CO5	Assessing the Women Empowerment and the role of Central & State Government in developing Women	K5

CATEGORY	COURSE CODE	TITLE	C	P	CREDIT
CORE:XII	17ITU15	OPERATING SYSTEM	72	-	5

Preamble

To learn about basic operating system abstractions, mechanisms and their implementations.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Understand Operating System	K1,K2,K4
CO2	Learn process handling	K2,K3,K4
CO3	Analyze how multi program is handled	K2,K3,K4
CO4	Obtain knowledge in storage	K2,K3
CO5	Learn scheduling algorithms	K2,K3,K4.K5

CATEGORY	COURSE CODE	TITLE	C	P	CREDIT
CORE:XIII	17ITU16	LINUX PROGRAMMING	72	-	5

Preamble

To learn about Linux programming languages, tools and concepts.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Learn fundamentals of Linux	K1,K2
CO2	Obtain knowledge in files	K2,K3
CO3	Gain information about how Linux environment works	K2,K3,K4
CO4	Learn basics of terminal communication	K1,K2
CO5	Learn about curses	K2,K3,K4

CATEGORY	COURSE CODE	TITLE	C	P	CREDIT
CORE:XIV	17ITU17	PROGRAMMING IN LINUX - PRACTICAL	-	72	4

Subject Description: This course provides programming knowledge in Linux

Goal: To enable the students to gain skills in shell programming

Objectives: On successful completion of the course the students will understand the concepts of Operating System through Linux

CATEGORY	COURSE CODE	TITLE	C	P	CREDIT
ALLIED:IV	17ITU18	CUSTOMER RELATIONSHIP MANAGEMENT	60	-	4

Preamble

To enable the students to learn the basics of Customer Relationship Management

Course Outcomes

On successful completion of the course the students should have:

CO Number	CO Statement	Knowledge Level
CO1	Understood relationship marketing	K1,K2,K4
CO2	Learn customer relationship management	K2,K3,K4
CO3	Learnt sales force automation	K2,K3,K4
CO4	Acquire knowledge of business management	K3
CO5	Learn database marketing	K2,K3,K4,K5

CATEGORY	COURSE CODE	TITLE	C	P	CREDIT
SKILL ENHANCEMENT COURSE:II	17SIU02	R TOOL - PRACTICAL	-	48	2

Subject Description: This course provides hand on experience to Data Mining Using R.
Goal: Candidates pursuing this course will be aligned with the current market job requirements.
Objectives: This course is designed to imbibe the best practice programming skills in Data Mining with R with real world Machine Learning case studies.

CATEGORY	COURSE CODE	TITLE	C	P	CREDIT
CORE:XVI	17ITU20	RELATIONAL DATABASE MANAGEMENT SYSTEM	72	-	4

Preamble

To enable the students to learn about the concepts of database system and manipulation of data.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Understand the basic concepts of database system	K1,K2
CO2	Ability to implement the relational database concepts	K3,K5
CO3	Acquire the deep knowledge on normalization techniques	K2,K3,K4
CO4	Understand the detailed knowledge on PL/SQL	K3,K4,K5
CO5	Ability to work with PL/SQL statements	K5

CATEGORY	COURSE CODE	TITLE	C	P	CREDIT
CORE:XVII	17ITU21	VB.NET PROGRAMMING	72	-	4

Preamble

To enable the students to learn about the .NET Framework and VB.NET programming.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Understand the .NET framework programming	K1,K2
CO2	Acquire the deep knowledge on data types, operators and control statements in VB.NET	K2,K3,K4
CO3	Implement the concept of arrays, procedures and structures using various VB.NET controls	K3,K5
CO4	Ability to work with menus and dialog boxes in VB.NET	K4,K5
CO5	Ability to handle exceptions and effectively work with database connectivity using ADO.NET	K3,K5

CATEGORY	COURSE CODE	TITLE	C	P	CREDIT
CORE:XVIII	17ITU22	PROGRAMMING IN VB. NET AND ORACLE – PRACTICAL	-	72	4

Subject Description: This course provides hands on experience on VB.NET Programming and Oracle

Goal: To enable the students to work effectively with VB.NET and Oracle

Objectives: On successful completion of the course the students will be able to build real world applications using VB.NET and Oracle

CATERGORY	COURSE CODE	TITLE	C	P	CREDIT
CORE :XIX	**	**CORE OPTIONAL**	**36**	**-**	**3**

Subject description: This course provide complete knowledge in Adobe Pagemaker and Coreldraw

Goal: To enable the students to develop and design with creativity

Objectives: To learn how to create and design real-time applications

CATEGORY	COURSE CODE	TITLE	C	P	CREDIT
ELECTIVE:I	17ITU25A	E-LEARNING	72	-	4

Preamble

To understand the basic concepts of E-Learning and its tools.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Understand the evolution of E-Learning and its tools	K1,K2
CO2	Obtain the knowledge about Flash and its tools	K3,K4
CO3	Gain the deep knowledge on animation and its effects	K3,K4
CO4	Acquire the knowledge on sound and video effects in flash	K3,K4,K5
CO5	Ability to develop a video using adobe premiere	K5,K6

CATEGORY	COURSE CODE	TITLE	C	P	CREDIT
ELECTIVE:I	17ITU25B	ANIMATION TECHNIQUES	72	-	4

Preamble

To understand the basic concepts of animation and Flash.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Understand the basic concepts of animation	K1,K2
CO2	Obtain the knowledge about creating animation in Flash	K2,K3,K4
CO3	Obtain the knowledge about 3D animation and its types	K3,K4
CO4	Acquire the knowledge to work effectively with 3D motion capture	K4,K5
CO5	Ability to develop a video, Audio using 3D animation	K5,K6

CATEGORY	COURSE CODE	TITLE	C	P	CREDIT
ELECTIVE:I	17ITU25C	BUSINESS INTELLIGENCE	72	-	4

Preamble

To understand the basic concepts of Business Intelligence and Data mining

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Understand the basic concepts of Business Intelligence	K1,K2
CO2	Obtain the knowledge about Decision Making	K2,K3
CO3	Gain thorough knowledge on Decision Support System and Knowledge based Management	K3,K4,K5
CO4	Understand and apply the concepts of Data Mining and its Applications	K3,K4
CO5	Acquire the knowledge on Data Warehousing and its architecture	K2,K3

CATEGORY	COURSE CODE	TITLE	C	P	CREDIT
SKILL ENHANCEMENT COURSE:III	17SIU03	FLASH – PRACTICAL	-	36	2

Subject Description: This course provides hands on experience on Flash

Goal: To enable the students to create animation, game, video and movie

Objective: On successful completion of the course the students will understand the concepts of Animation techniques using Flash

CATERGORY	COURSE CODE	TITLE	C	P	CREDIT
PROFICIENCY ENHANCEMENT	17PEU01	SOFTWARE PROJECT MANAGEMENT	-	-	2

Preamble

To inculcate the knowledge on how to manage a Software Project.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Understand the importance of software product life cycle	K1,K2
CO2	Obtaining the knowledge thoroughly on software requirements gathering	K2, K3,K4
CO3	Gain detailed understanding on estimation concepts	K3,K5
CO4	Acquire familiarity on design and development phases	K4,K5
CO5	Accumulate and apply the knowledge on project testing phase	K4,K5

CATEGORY	COURSE CODE	TITLE	C	P	CREDIT
CORE:XXII	17ITU27	RESEARCH METHODOLOGY	72	-	5

Preamble

To enhance the ethical conduct of research and to learn about its techniques

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Understand the basic concepts of Research	K1,K2
CO2	Acquire the deep knowledge on Research problem and its design	K1,K2
CO3	Familiarize on sampling design	K2,K3
CO4	Give detailed understanding about data collection	K3,K4,K5
CO5	Ability to work with interpretation and writing reports	K5

CATEGORY	COURSE CODE	TITLE	C	P	CREDIT
CORE:XXIII	17ITU28	COMPUTER GRAPHICS AND MULTIMEDIA	72	-	5

Preamble

To learn about reconstruction and visualization framework and to give introduction on basic algorithms and its techniques.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Provide a insight of computer graphics and algorithms	K1,K2
CO2	Ability to understand the Transformations and its types	K2,K3,K4
CO3	Acquire knowledge on window transformations	K3,K4
CO4	Learn about Multimedia basics	K1,K2
CO5	Obtain basic fundamentals of image, audio and video	K5

CATEGORY	COURSE CODE	TITLE	C	P	CREDIT
CORE:XXIV	17ITU29	PROGRAMMING IN 3D MAX-PRACTICAL	-	72	4

Subject Description: This course provides hands on experience on 3D Max Programming

Goal: To enable the students to equip them with graphics and multimedia skills

Objectives: On successful completion of the course the students will understand the concept of 3D Max and expertise in using graphics and multimedia

CATEGORY	COURSE CODE	TITLE	C	P	CREDIT
ELECTIVE:II	17ITU30A	NETWORK SECURITY	60	-	4

Preamble

To provide grounding in basic and advanced methods in network security and its effective algorithms

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Obtain the basics of network security	K1,K2
CO2	Acquire the knowledge on symmetric key algorithms	K2,K3
CO3	Learn about Asymmetric Key Algorithms and Digital Signatures	K2,K3,K4
CO4	Provide the insight on digital certificates	K2,K3
CO5	Understand about Network Security, Firewalls and Virtual Private Networks	K1,K2

CATEGORY	COURSE CODE	TITLE	C	P	CREDIT
ELECTIVE:II	17ITU30B	MOBILE COMPUTING TECHNIQUES	60	-	4

Preamble

To learn about the mobile computing basics and advanced techniques.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Understand the emergence of Mobile technology and its architecture	K1,K2
CO2	Acquire the knowledge on mobile computing through telephony	K2,K3
CO3	Learn about emerging technologies	K2,K3
CO4	Provide the insight on GPRS	K3,K4
CO5	Acquire the knowledge on CDMA and 3G	K4,K5

CATEGORY	COURSE CODE	TITLE	C	P	CREDIT
ELECTIVE:II	17ITU30C	EMBEDDED SYSTEMS	60	-	4

Preamble

To learn about the Embedded systems and its important concepts.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Obtain the introduction to embedded systems	K1,K2
CO2	Acquire the knowledge on processor and memory organization	K2,K3
CO3	Learn about programming concepts and about threads	K2,K3
CO4	Provide the insight on Real time operating system	K3,K4
CO5	Work with case study	K5,K6

CATEGORY	COURSE CODE	TITLE	C	P	CREDIT
ELECTIVE:III	17ITU31A	NEURAL NETWORKS	60	-	4

Preamble

To learn about the concepts of biological Neural Network, Artificial neural network and its applications.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Obtain the introduction to Artificial neural networks and its models	K1,K2
CO2	Acquire the knowledge on Backpropagation networks	K1,K2
CO3	Learn about activation and synaptic dynamics	K1,K2,K3
CO4	Study different pattern recognition task using ANN	K3,K4
CO5	Learn about feedforward networks and ANN applications	K4,K5

CATEGORY	COURSE CODE	TITLE	C	P	CREDIT
ELECTIVE:III	17ITU31B	GREEN COMPUTING	60	-	4

Preamble

To acquire knowledge to adopt green computing practices to minimize negative impacts on the environment, skill in energy saving practices in their use of hardware, examine technology tools that can reduce paper waste and carbon footprint by user, and to understand how to minimize equipment disposal requirements.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Obtain the fundamentals of green computing and its IT strategies	K1,K2
CO2	Learn about green assets, modeling and information systems	K2,K3
CO3	Acquire knowledge on grid framework	K2,K3
CO4	Understand the concept of green compliance	K2,K3
CO5	Work with case studies	K5,K6

CATEGORY	COURSE CODE	TITLE	C	P	CREDIT
ELECTIVE:III	17ITU31C	ARTIFICIAL INTELLIGENCE	60	-	4

Preamble

To learn about the concepts of artificial intelligence and expert systems.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Obtain the introduction to Artificial intelligence	K1,K2
CO2	Acquire the knowledge on game playing algorithms and predicate logic	K2,K3
CO3	Learn about knowledge representation	K2,K3
CO4	Study about expert systems	K2,K3
CO5	Learn about the basics of semantic networks	K3,K4

CATEGORY	COURSE CODE	TITLE	C	P	CREDIT
SKILL ENHANCEMENT COURSE:IV	17SIU04	SOFTWARE TESTING - PRACTICAL	-	24	2

Subject Description: This course provides an opportunity to develop testing skills and to learn different kinds of testing.

Goal: To enable the students to equip them with testing the software after development phase.

Objectives: On successful completion of the course the students will understand the concept of software testing and expertise in using testing in software.